Patterns of Growth in Executive Functioning: Contributions of Mother-Child Attachment Security and Maternal Autonomy Support.

Sophie REGUEIRO[1], Célia MATTE-GAGNÉ[2], & Annie BERNIER[1]
(1) University of Montreal, Canada (2) Laval University, Canada

Summary

The current study sought to examine the parenting precursors of individual differences in executive functioning (EF) patterns of growth during school years (Grades 2 to 4). We tested the predictive roles of mother-child attachment security (15 months and 2 years) and maternal autonomy support (15 months and 3 years) in the developmental trajectories of working memory, cognitive flexibility, and planning. Growth curve analyses revealed a sustained relation between attachment security and the acquisition of all EF skills, whereas autonomy support was associated with the initial development of planning skills.

Introduction

- Few longitudinal studies have examined developmental **patterns of change in EF** during school years and their predictors (Clark et al., 2013).

- Different aspects of mother-child relationships predict child EF at different ages, notably **maternal autonomy support** (encouraging children's independent problem-solving and choices; Grolnick & Ryan, 1989) and **attachment security** to primary caregivers (Valcan et al., 2017).

Aim

Investigate the predictive roles of early **mother-child attachment security** and **maternal autonomy support** in the **patterns of growth in child EF** at school age.

Method

- Low risk community sample
- 102 mother-child dyads (43 boys)

Procedure : six home visits over nine years

Measures

Attachment security

- Attachment Behavior Q-Sort (Waters, 1995) : an observational measure that assesses the quality of the child's attachment behaviors toward his/her mother
- Rated based on 90-minute home visits (15 months and 2 years)
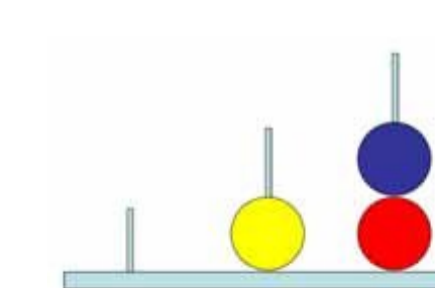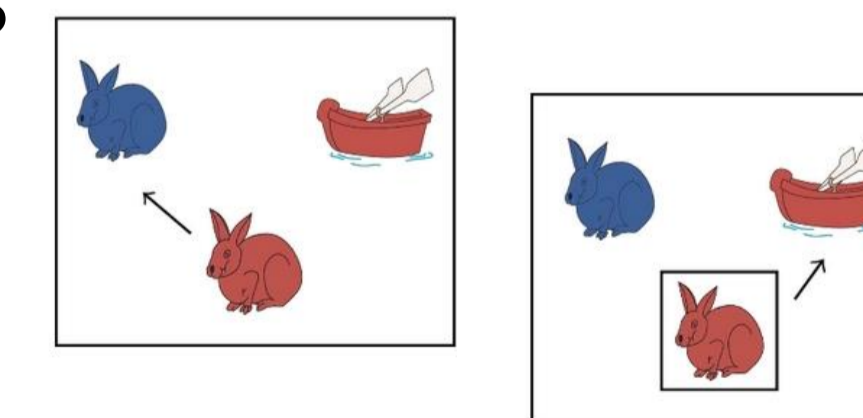
Autonomy support

- Whipple et al.'s (2011) coding system applied to a 10-min videotaped problem-solving sequence (15 months) and a clean-up task (3 years)
- 4 Likert scales averaged into a total autonomy support score : 1) Appropriate help, 2) Maternal verbalizations, 3) Perspective taking, and 4) Supporting volition

> For both measures :
> - Good inter-rater reliability (ICC = .70 to .93)
> - Scores were averaged across the two timepoints

Child EF

- Assessed yearly from Grades 2 to 4 (7-11 years)
- Three tasks capturing **working memory** (1), **cognitive flexibility** (2), and **planning** (3) :
  - 1) Backward Digit Span (Carlson et al., 2002) : number of trials succeeded (/16)
  - 2) Dimensional Change Card Sort (DCCS; Zelazo, 2006) : mean reaction time on correct trials

  - 3) Tower subtest from the NEPSY battery (Korkman et al., 1998) : total score (/20)

Statistical analyses

- Individual growth curves for each EF task in Mplus 7.4
- Multilevel modeling framework
- Level-2 predictors : attachment security <u>and</u> autonomy support
- Intercept : initial status in Grade 2
- Slope : rate of change per year from Grade 2 to 4

Results

Table 1. EF tasks predicted by **attachment security**

	Intercept		Slope	
	B	*p*	*B*	*p*
Backward	**1.42**	**.038**	-0.54	.154
DCCS-RT	**-0.43**	**.019**	0.13	.076
NEPSY Tower	**2.20**	**.047**	-0.92	.061

- Mother-child attachment security was **persistently and uniquely associated** with **higher scores** on the **Backward Digit Span** and the **NEPSY Tower**, and with **lower reaction times** on the **DCCS**.

Table 2. EF tasks predicted by **autonomy support**

	Intercept		Slope	
	B	*p*	*B*	*p*
Backward	0.13	.443	-0.03	.749
DCCS-RT	0.03	.378	-0.03	.150
NEPSY Tower	**0.60**	**.012**	**-0.42**	**.002**

- Maternal autonomy support was **uniquely associated** with **better initial performance** on the **NEPSY Tower**.
- However this positive effect **was not persistent** and tended to decrease with age.

Conclusion

- These results emphasize the role of early parent-child attachment relationships in the understanding of children's executive development.

- They also highlight the importance of supporting children's autonomy to foster the initial development of more complex EF abilities, such as planning.